Stephen H. McCracken, Project Manager
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Weldon Spring Site Remedial Action Project Office
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Dear Mr. McCracken,

The time has come, it seems, when I can refocus on the goal of realistically evaluating the proposed actions for the Weldon Spring site. I do not refer to the real realistic evaluation because it surely is based on the actual hazard than risk analysis.

Recent reports on television and in news papers indicate, people are dying from exposures to toxic chemicals, nuclear power plant disasters, drunken drivers and incompetent health care. If one avoids these hazards and with little help from replacing the overused and tired organs and tissues, dying seems like a happening of the past centuries. All that needs to be done is to reduce life to zero risk. This will require first the full understanding of risk analysis as carried out by experts.

The comparitive listing of various risks (as provided in the RI/FS-EIS) makes it evident that I have to give up being a policeman with a 2×10^{-4} annual risk of death (AR), driving motor vehicles (2×10^{-4} AR), and being a "frequent flying" professor (6×10^{-5} AR). I was, to say the least, stunned to find that by switching from city water (6×10^{-7} AR) to what the Environmental Protection Agency considers contaminated water at the Raffinate pits, I could actually lower my risk by a factor of 500. It was also distinctly unnerving to find out that the Potassium in my body, which contains a radioactive isotope, gave me 4-500 times the radiation level of that of the air around the Chemical Plant Area, and 100 times that from being a hiker in the Weldon Spring wild life area. Should we, I wondered, abandon superfund and find a substitute for Potassium in the body? Astonishingly, corn contains aflatoxin at appreciable levels as does peanut butter and, for me, giving up these two delicacies is not going to be an easy trade-off for mere immortality. Apparently, plants learned through evolutionary time that chemical warfare is an extremely effective way to fight off fungi, insects, and animal predators. Unfortunately, these species have the same type of genetic code as I do, so that whatever I eat, I am consuming mutagens and carcinogens rated everywhere as hazardous to my health.

Clearly, to get to zero risk I must give up walking up and down stairs, not play physical sports, or live in a metropolitan area with a population higher than 100,000, and innumerable other temptations. I am willing to sit in a rocking chair with a Lead roof over my head and be fed amino acids intravenously in order to live forever.

Still, a scientist does not necessarily see risk in the same way as the public does. The public regards deaths caused by mysterious and invisible technology (such as nuclear power plant failure or the threat from high voltage or electromagnetic fields) or the

Baseline Assessment: DOE/OR/21548-091
5-40

Concern: In, general, sitewide contaminants are at or near background concentrations. Local background concentrations of radionucleides in the .....

Question: What are the total amounts of radioactivity in the entire contaminated area? There must be a way of determing these quantities for each radioactive isotope in soil, water, and air.

Rationale: These values can be better related to established levels and risk factors may then be evaluated more realistically.

5-41

Concern: The health effects associated with exposure to lead could not be quantitatively assessed because of the unavailability of toxicity values or models appropriate for the receptors evaluated in this BA. However, levels exceeding general EPA guidelines for lead concentrations in soil for residential settings have been measured at only a few on-site locations. The fetus and oyung children are especially sensitive to the effects of lead, which includes premature birth.....

Question: Why was this not quantitatively assessed and data obtained on more sites? Even if minimal exposures are recieved by the receptors during the clean-up period it is an important factor in alleviating the fears of the general public.

Rationale: The health effects associated with exposure to lead must be quantified in view of the sensitive effects on fetus and young children, especially since the effects are well documented in scientific journals and news papers.
This is also indicative of the practice used in this entire study. Scarcirty of data is often treated very lightly with general statements, and justified as posing minimal risk. This approach should be avoided adnd every attempt should be made to obtain more data.

Tables D.3 & D.5 and I-39 of feasibility study

Concern: Limits of various inorganic and organic contaminants.

Question: How can comparisons of data be made to limits set by yourself as safe levels?

Rationale: It seems odd to compare the contaminant concentration as acceptable risks based on EPA data. This is done by comparing with limits set by yourself and justifying the exposures acceptable at a later time.

Remedial Investigation: DOE/OR/21548-074

ES-3 and ES-7
Concern: The major component in the wastewater was selite sodium sulfite used in the purification of trinitrotoluene (TNT).

Question: Sodium sulfite and nitrate were found in high concentrations in the water. Are these removed in the ion-exchange type of water purification plants used at this site?

Rationale: Ion exchanger-type of water purification generally is used for the removal of metals. Does it also remove nitrates and sulfites. If not removed, these may eventually get reduced and become potentially hazardous to the public using the treated water.

5-126

Concern: The data provided on bio-uptake studies is from 1987-1990.

Question: Do these data reflect all the studies carried out to date on biouptake?

Rationale: I am aware of atleast one project on small rodents carried out by the Dept. of Biology at Lindenwood college. I believe those results are not included. Are there other studies which have to be included which we are not aware of? In a critical study of this nature, every available data should be included in the evaluation of the risk to the public.

Proposed Plan: DOE/OR?21548-160

p. 4 para. 2
Concern: Separate documentation has been completed for cleanup action at the Quarry, and additional documentation is forthcoming.

Question: When can we expect this?

Rationale: I am a little confused about the time sequence of the cleanup. In the overall evaluation of the hazard at the site the Quarry site waste was included , yet the data and related studies are not included in these documents. Why are they being included in a separate document?

p. 17 4.1.1
Concern: The public uses the surrounding wildlife area for hiking, hunting, and fishing.

Question: How many total number of people use the surrounding wild life area per year?
Rationale: The effects of before and after the cleanup can be better appreciated by the general public if increased safety and less risk can be documented. This is important for risk analysis. See general comments below.

Expression of Risks: Just as a comparison of risks is an aid in understanding them, so is a careful selection of the methods of expression. It is hard to comprehend the hazard quotients and index used in the preparation of the documents of this study. It is important to realize that risks appear to be very different when expressed in different ways (A. Taversky and D. Kahneman. SCIENCE., 211,453 (1981)). One example of this can be seen if we consider the cancer risk to those persons exposed to radionucleides ater the Chrenobyl disaster. Acoording to the Soviets, the 2400 persons between 3 and 15 kilometers from the plant, but excluding the town of Pripyat, recieved and are expected to reciece 1.05 million man-rems total integraed dose, or about 44 rems average. Even if we asume a linear dose-response relation, with 8000 man-rems per cancer, the risk may be expressed in different ways. Dividing 1.05 million man-rems by 8000 gives 131 cancers expected in the lifetimes of that population. This is larger than, and for some people more alarming than, 31 people within the power plant itself who died within 60 days of acute radiation sickness combined with burns. Dividing the 131 again by the approximately 5000 cancer deaths expected from other causes, the accident caused "only" a 2.6% increase in cancer. This seems small compared to the 30% of cancers attributable to cigareete smoking. The difference is even more striking if we consider the 75 million pepole in Byelorussia and the Ukraine who recieved, and will recieve, 29 million man-rems over their lifetimes. On the linear dose-response relation this leads to 3500 "extra cancers", surely a large numbrn for one accident. But dividing by the 15 million cancers expected in the population leads to an "insignifacant" increase of 0.0047%. Of course, none of the methods of expressing the risk can be considered "right" in an absolute sense. Indeed it is my beleif that a full understanding of the risk involves expressing it in as many ways as possible.